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Modeling ground magnetic field disturbances using satellite magnetometers

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Invited Oral

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The Average Magnetic field and Polar current System (AMPS) model is a statistical model of the ionospheric magnetic disturbance field. It is derived from magnetic field measurements in space, from the Swarm and CHAMP satellites, and it varies smoothly as a function of the interplanetary magnetic field, solar wind velocity, the dipole tilt angle and F10.7 index. Although the AMPS model describes the magnetic field in space, corresponding disturbances on ground can be calculated from the associated electric current system. Comparisons with data show that ground magnetic disturbances are typically underestimated in such calculations. When averaging over longer time windows, this tendency gets more pronounced, while the correlation improves. We interpret this behaviour in terms of two effects: The statistical properties of the solar wind-magnetosphere system, and the effect of ground induced currents.